of the synthetic fiber that contains from 1% by weight or more to 6% by weight or less of a white pigment and/or the core-sheath composite synthetic fiber comprising a core portion that contains from 3% by weight or more to 15% by weight or less of a white pigment, and a sheath portion containing 2% by weight or less of a white pigment, and at least one inner layer thereof, other than the top or surface layer, being formed with a yarn composed of the water-absorbent and water-diffusing fiber.

REMARKS

Claim 3 has been amended to delete the bracketed material mistakenly left in the claim in the last Amendment. Applicants apologize for any confusion this may have caused. The claims pending are claims 3 and 7-10.

In the Office Action, the Examiner continued to reject claims 3, 7, and 10 under 35 U.S.C. §102(a) for being anticipated by Hayakawa et al, (JP9-273,085), hereafter referred to as JP'085. In the last response, applicants informed the Examiner that the two inventors listed in JP'085 are the same as two of the inventors of this application, namely Hayakawa and Kataoka, and that these two inventors are the inventors of at least main claim 3. Therefore this reference was not available as a prior art reference against claim 3 or any claims dependent therefrom.

Apparently the Examiner has accepted applicants showing the "T. Hayakawa" listed as one of the inventors in JP'085 is the same person as "C. Hayakawa" listed as one of the inventors in this application. However, the Examiner maintains that since this application includes a third inventor, H. Ikenaga, it is to a different inventive entity than the inventive entity of JP'085 and therefore it is a valid reference under §102(a).

The inventive entity of JP'085 is different than the inventive entity of this application. However, only inventors C. Hayakawa and N. Kataoka, the inventive entity

of JP'085, are the inventors of the invention claimed in main claim 3. As the Examiner knows, all of the inventors do not need to be the inventors of all of the claims. So long as they are the inventor of at least one claim, they can be listed as a joint inventor.

Thus while the presumption may be that the three applicants in this case are the inventors of all of the claims, it was pointed out in the last response that, in fact, only inventors Hayakawa and Kataoka are the joint inventors of the invention of claim 3, as well as claim 10. Inventor Ikenaga is only a joint inventor of the subject matter of claims 7-9.

In support of applicants' position and in compliance with M.P.E.P. §716.10, enclosed is a Declaration signed by all of the inventors confirming the fact that the inventions of claims 3 and 10 are the inventions of only Chisa Hayakawa and Naoki Kataoka, the same inventive entity of JP'085. Inventor Chisa Hayakawa has been married since this application was filed and is now "Chisa Yoshizawa." Hence, she signed the Declaration as "Chisa Yoshizawa." However, "Chisa Yoshizawa" and "Chisa Hayakawa" are the same person. If a further Declaration attesting to this fact over the signature of Chisa Yoshizawa, nee Hayakawa is required, please advise.

In any event, by this Declaration it has conclusively been shown that the teachings of JP'085 relied on to reject main claim 3 originated with the applicants of claim 3. This is the same situation as described in Example 2 and the paragraph that follows in M.P.E.P. §716.10, page 700-250. Accordingly, it is submitted that JP'085 is not available as a reference against claim 3 under 35 U.S.C. §102(a). Nor is it available under §102(b) since it was published less than one year before the international filing

date of April 28, 1998, which is the effective filing date of this application under 35 U.S.C. §363.

Withdrawal of the rejection of claim 3 and claims 7 and 10 since they depend from claim 3 and therefore include all of its subject matter under 35 U.S.C. §102(a) for being anticipated by JP'085 is therefore requested.

Similarly, withdrawal of the rejection of claim 9 for being anticipated by or in the alternative for being obvious over Hayakawa is requested. Though claim 9 is the invention of all of the three inventors, it is dependent from claim 3 and therefore includes all of its subject matter. Accordingly, if JP'085 is not available as a reference against claim 3, it is not available against dependent claim 9.

Background of the Claimed Invention

The surface color depth of a colored solid body (fiber or fabric) is determined by the proportion of the amount of white light reflected to that of colored light reflected over the surface of the solid body. The colored light is an unabsorbed visible ray (=light) having a specific band-of wavelength reflected in the interior of the solid body. Accordingly, the color depth of a colored solid body varies with a change of the proportion of white light relative to colored light over the surface of the solid body surface. When the proportion of white light reflected becomes smaller relative to colored light, the color of the solid body looks deeper.

The proportion of white light reflection relative to colored light reflection varies with a change in the apparent refractive index of a solid body (see the specification at page 2, lines 14 to 35). The color of a dyed fiber (fabric) temporarily becomes deep when the dyed fabric gets wet with water. This color depth alteration results from the reduced refractive index of the wet fiber.

The refractive index of liquid water (1.33) is much smaller than that of a fiber (1.5 to 1.7). Any wet fiber naturally has a decreased refractive index, which is significantly smaller than that of the dried fiber, whereby diffuse reflection of white light at the surface of fiber is significantly reduced. This is the physical mechanism of the visual phenomenon that makes a wet dyed fabric look deep colored.

This visual color depth alteration of wet fabric can be mitigated to a certain extent by making use of a composite fabric structure, the top or surface layer of which is formed of a white-pigment containing fiber. The applicants, however, found that this is not sufficient to make up for the reduced white light reflection due to the reduced refractive index caused by wetting the dyed fiber.

In the present invention as set forth in claim 3 (see the specification at page 4, lines 26 to 34), with the presence of an inner layer formed of a water-absorbing and diffusing fiber, besides the top layer containing a white pigment, the water locally present within the composite fabric can be promptly removed by migration from the top layer towards the inner layer, whereby the color change as seen from the outside of the composite fabric can be made less visually distinct. As the migration of water from the top layer towards the inner layer proceeds, diffuse reflection of white light of the white pigment containing fiber comes to be more enhanced due to resumption of the inherent refractive index of the fiber (dried).

For these reasons, any temporal color depth change of a dyed fabric used in an outer garment caused by local wetting can be successfully prevented or mitigated by the composite fabric of claim 3 having a multi-layered structure of two layers or more, a top or surface layer thereof being formed with a yarn composed of a synthetic fiber that

contains a specific amount of white pigment, and at least one inner layer thereof, other than the top or surface layer, being formed with a yarn composed of the water-absorbent and water-diffusing fiber. As a result, water locally present within the top layer of the composite fabric will be promptly dispersed or migrate towards the inner layer so as to minimize (or remove) the localized presence of water in at least the top layer of the fabric

The invention of claim 7 is a specific embodiment of claim 3 as it enables a color change to become even more unnoticeable because the water-absorbent and water-diffusing fiber itself hardly changes in color when the fabric gets wet (see page 10, lines 29 to 35 and page 10, line 37 to page 11, line 9).

The invention of claim 8 is a specific embodiment of claim 3, which provides a stretchable composite fabric.

The invention of claim 9 is a specific embodiment of claim 3 in which the water-absorbent and water-diffusing fiber used to form the composite fabric structure has an appropriate specification of water-absorbability and water diffusibility (see page 8, line 14 to page 9, line 11). In the present invention value X for the water-absorbent and water-diffusing fiber is selected to be greater than that of the white-pigment containing fiber forming the top or surface layer so as to promptly migrate water from the top or surface layer of the fabric to the inner layer (see page 8, line 35 to page 9, line 3).

The invention of claim 10 is a specific embodiment of claim 3 in which the water-absorbent and water-diffusing fiber has a W-shape cross section. A W-shaped cross section imparts a greater capillary action and water-retaining characteristic, which

serve to make a composite fabric having both anti-color change properties and wearing comfort (see page 10, lines 4 to 25).

Examiner's Rejections

In the Office Action the Examiner rejected claims 3 and 7-9 for being obvious over a newly cited reference to Moretz et al. (U.S. Patent No. 5,269,720), hereafter Moretz, in view of Mouri et al. (U.S. Patent No. 5,690,922), hereafter Mouri, and claim 10 further in view of Unitika (JP61-231,274), hereafter Unitika.

Moretz describes a moisture management brassiere which comprises a brassiere body having a body and back strap. The body and back strap are formed of a stretch fabric having a moisture transport fabric layer constructed of hydrophobic yarns which defines a first fabric face for skin contact and for wicking moisture away from the skin, and a moisture dispersal fabric layer constructed of hydrophilic yarns that defines a second fabric face residing in spaced-apart relation from the skin during garment wear (see Abstract).

According to an embodiment shown in Fig. 1, the body 11 and back straps 14 are formed of a stretch fabric 17 having a moisture transport fabric layer 17A and a moisture dispersal fabric layer 17B. Moisture transport fabric layer 17A is constructed of hydrophobic yarns which define a first fabric face for residing in skin contact during garment wear for wicking moisture away from the skin, and moisture dispersal fabric layer 17B is constructed of hydrophilic yarns which define a second fabric face residing in space-apart relation from the skin during garment wear for receiving the moisture from the hydrophobic moisture transport layer 17A (column 4, lines 55 to 61).

The fabric layer 17A may be of polyester or polypropylene fiber and fabric layer 17B may be of nylon, cotton, rayon and blends of hydrophilic nylon, and

conventional nylon. Stretch yarns are incorporated into the fabric 17 for providing stretch to the body 11 and back straps 14 (column 4, line 62 to column 5, line 3).

In Fig. 2, a fabric structure forming the brassiere cups 15, 16 is described (see column 5, lines 13 to 27). Each cup comprises a hydrophobic fabric layer 21 (for example, composed of polyester wicking fibers capable of transporting moisture) for residing next to the skin to quickly transport moisture away from the skin and a hydrophilic intermediate fabric layer 22 disposed adjacent to the outer fabric face of fabric layer 21 for receiving the moisture from the hydrophobic moisture fabric layer 21. The intermediate fabric layer 22 spreads moisture along its fibers and thereby enhances evaporation and reduces the likelihood of liquid moisture penetration staining outer clothing. The third outer most layer 23 from the outer surface or shell of the brassiere cup is liquid impermeable, but vapor permeable.

Mouri relates to de-odorizing fiber useful for rapid decomposition, removal and deodorization of disagreeable smell components derived from, for example, tobacco, perspiration or a building material (column 1, lines 6 to 11). The fiber is produced by incorporating titanium oxide or other photo-catalyst and an adsorbent comprising a phosphate of a tetra-valent compound and a hydroxide of a di-valent metal into the fiber-forming polymer. The respective amounts of photo-catalyst and adsorbent incorporated are 0.1 to 25% by weight. The fiber may have a sheath-core structure in which the concentration of the photo-catalyst in the sheath is higher than that of he core. The fiber may have a modified cross-section (Abstract). Preferred photo-catalysts are CdS, ZnS and other sulfide-semi-conductors and TiO_2, ZnO, SnO_2 ZnO_2 (column 4, lines 29 to 39). The photo-catalyst acts as a photo-oxidizing catalyst

by producing active oxygen on exposure to light irradiations such as ultraviolet ray irradiations, thereby oxidizing and decomposing a variety of harmful and malodorous components. Therefore the photo-catalyst belongs to the category of an oxidizing photo-catalyst. Use of such photo-catalysts results in deodorization so that the deodorizing effect can be maintained over a long period (column 4, lines 1 to 14). A sheath core type composite fiber, nylon containing de-odorizing composition (a pale colored powder catalyst, Cu(II)-Ti(IV)-SiO_2; 80 parts/TiO_2) at 25 wt% for sheath/polyethylene terephthalate (TiO_2) for core is prepared to provide a fabric (Column 17, line 16 to column 18, line 36). Similar fibers are embodied in Examples 2 through 5. The fibers of these examples exhibit deodorizing effects on basic, acidic, and neutral malodorous components (Column 21, Tables 1, 2, and 3).

Thus the fabric of Moretz is essentially for an undergarment worn beneath outer clothing that keeps the skin as dry as possible while preventing outer clothing from becoming wet from leakage through the garment from inside to outside. As noted above, the fabric is a composite fabric of a moisture transfer fabric layer and a moisture dispersal fabric layer. The moisture transport fabric layer formed of a hydrophobic yarn is disposed next to the skin (of the wearer) for wicking moisture away from the skin. The moisture dispersal fabric layer formed of hydrophilic yarn is disposed away from the skin forming a second face of the composite fabric for receiving moisture from the hydrophobic transport fabric layer.

It is clear in Moretz that the specific disposition of the hydrophobic moisture transport fabric layer and the hydrophilic moisture dispersal fabric layer is crucial to the featured function of enabling a brassiere made from it to keep outer clothing from

becoming wet by liquid (milk or perspiration) coming from the interior of the brassiere. Thus the reference in no way teaches or suggests the conceptual idea of the present invention of preventing temporal color depth change of a dyed fabric used to make an outer garment when the garment becomes wet, for example, from rainwater. Obviously this is not a concern of Moretz (i.e., whether the layer next to the skin changes color if it becomes wet) because it is on the inside of the garment and not seen.

Moreover, because the hydrophobic moisture transport fabric layer of Moretz is to be disposed next to the human skin, there is no reason for it to necessarily be of a white-pigment containing fiber. Any fabric layer forming a brassiere, particularly in contact with the human skin has no reason for it to be composed of a white-pigment containing fiber. As noted above, under the Background section (Page 4), white pigment in the top or surface layer of the composite fabric of the invention helps mitigate color depth alteration when the fabric becomes wet, but the applicants found that this could be further mitigated by combining it with the claimed inner layer made of water-absorbent and water-diffusing layer.

While the Examiner believes it would have been obvious to include white pigment in the hydrophobic moisture transport layer (i.e., the inner layer next to the skin) of Moretz in view of Mouri, it is submitted the only suggestion to do so comes from a reading of applicants' specification and not from anything taught by either Moretz or Mouri for at least two reasons.

First, the white pigment is used for an entirely different purpose in Mouri namely, as an oxidizing photo-catalyst than in the present invention where it is used to minimize visual color alteration when the outer layer of the composite fabric becomes wet.

Secondly, there is clearly no need for white pigment to be in the hydrophobic or inner layer of Moretz either to minimize color alteration of that layer of the fabric next to skin when it becomes wet or for its oxidixing properties. Thus it is submitted that it cannot be said that it would have been obvious to include white pigment in the hydrophobic moisture transport layer of Moretz in view of Mouri.

As noted repeatedly by the Federal Circuit and as expressed, for example, in Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 227 U.S.P.Q. 543 (Fed. Cir. 1985) at page 551.

> When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself.

Further, in Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, U.S.P.Q. 2d 1434 (Fed. Cir. 1988), the court noted

> Something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. [837 F.2d at 1051, 5 U.S.P.Q. 2d at 1438, citing Lindemann, 730 F.2d 1452, 1462, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).]

When the use of white pigment containing yarn in the outer or surface layer of the claimed composite fabric is to minimize color alteration when that surface of the fabric becomes wet, which alteration is further lessened by the claimed inner layer, where is this "desirability" of using such a yarn suggested in the Mouri reference?

Withdrawal of the rejection of claim 3 for being obvious over Moretz in view of Mouri is therefore requested.

With respect to claims 7-9, these claims are patentable over the cited combination of references for the same reasons expressed above with respect to claim 3 .

In addition and with respect to claim 7, there is no suggestion in either of the cited references or any reason to also include white pigment in the moisture dispersal fabric layer of Moretz.

With respect to claim 9, this relates to the specific properties of the water-absorbing and water-diffusing fiber of the inner layer of the composite fabric. Since the parameters X and Y specified in claim 9 represent the water-absorbing and water-diffusing properties of the fiber in the form of a knitted fabric, they are specifically selected to provide the composite fabric with improved anti-temporal color change performance. Since this is a property never even hinted at, let along suggested in either of the references, it cannot therefore be said that these specific properties would be inherent in the moisture dispersal fabric layer of Moretz.

Finally, with respect to claim 10, Unitika may describe a fiber having a W-shaped cross section, but it does not disclose what is missing from the two primary references. Accordingly, it is submitted claim 10 is patentable for at least the same reasons claim 3 is patentable over the cited references.

It is believed claims 3 and 7-10 are in condition for allowance.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: July 14, 2003

By: _____
Arthur S. Garrett
Reg. No. 20,338

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APPENDIX TO AMENDMENT OF JULY 14, 2003

Version with Markings to Show Changes Made

Amendments to the Claims

3. (Twice Amended) A composite fabric [[according to claim 1, wherein the fabric has]] comprising a knitted or woven composite fabric of (1) a white pigment-containing fiber that is a synthetic fiber that contains from 1% by weight or more to 6% by weight or less of a white pigment and/or that is a core-sheath composite synthetic fiber comprising a core portion that contains from 3% by weight or more to 15% by weight or less of a white pigment, and a sheath portion containing 2% by weight or less of a white pigment, and (2) a water-absorbent and water-diffusing fiber, wherein the composite fabric has a multi-layered structure of two layers or more, a top or surface layer thereof [[is]] being formed with a yarn composed of the synthetic fiber that contains from 1% by weight or more to 6% by weight or less of a white pigment and/or the core-sheath composite synthetic fiber comprising a core portion that contains from 3% by weight or more to 15% by weight or less of a white pigment, and a sheath portion containing 2% by weight or less of a white pigment, and at least one inner layer thereof, other than the top or surface layer, being formed with a yarn composed of the water-absorbent and water-diffusing fiber.